

APPENDIX H

Cost Estimate Assumptions

Table of Contents

COST ESTIMATE ASSUMPTIONS	1
Implementation	
Operations and Maintenance	3

COST ESTIMATE ASSUMPTIONS

Cost estimates for the design and implementation of the short-term, medium-term and long-term deployment scenarios were made based on the following criteria:

- Unit costs for several items were taken from various sources, such as similar projects and discussions with NDOR staff.
- Study and design costs were calculated for each specific project and considered to be 10 to 20 percent of the total implementation cost depending on the complexity of the project.
- Annual communication cost (annual lease) was calculated based on US West rates and charges (August 16, 1995).
- Operations cost was calculated based on an estimate of the required personnel over the service life of the system.
- Maintenance cost was calculated based on the complexity of the system and the expected service lives of the system components.
- A contingency factor of approximately 15 percent was applied to the calculated costs.

For each deployment scenario category, the assumptions made for cost estimate calculations are as follows:

Implementation

	Unit	Unit Cost
Signal Systems		
Signal Timing Plan Development	Location	\$1,380
Controller Replacement	Each	\$12,000
Detection Station (Average)	Each	\$23,000
Traffic Control System	System	\$200,000-300,000
Hardwire Communications	Linear Foot	\$25.00
Computer Work Stations	Each	\$23,000
Adaptive Control Systems	Each demonstration	\$500,000-600,000
Computers	Each	\$5,000
Monitors	Each	\$1,000

	Unit	Unit Cost
Surveillance		
CCTV Installation	Location	\$50,000
DS3 Lease	Each channel	\$1 ,000/month
	Unit	Unit Cost
Area-wide Traffic Management and Information Center (ATMIC)		
Expert System Implementation	Lump sum	\$115,000
Smart Corridor Implementation	Each intersection	\$63,000
Ramp Metering	Location	\$75,000
	Unit	Unit Cost
Traveler Information System		
Highway Advisory Radio (Low Power)	Each Unit	\$14,000
Highway Advisory Radio (High Power)	Each Unit	\$23,000
DS3 Lease Cost	Channel	\$200/month
Changeable Message Sign	Each	\$170,000
Trailblazers	Each	\$58,000
System Loops and Controller	Location	\$29,000
Database Development	Lump Sum	\$58,000
Graphics Development	Lump Sum	\$23,000
Kiosks	Each	\$19,000
Internet/Computer Bulletin Board	Lump sum	\$230,000
	Unit	Unit Cost
Incident Management		
Freeway Service Patrol Trucks	Each	\$200,000
Access Ramps Implementation	Each	\$5,000
Reference Markers	Each	\$10,000
Accident Investigation Site	Each	\$115,000
Equipment Storage Site	Each	\$180,000

	Unit	Unit Cost
Traveler Demand Management		
HOV Implementation	Mile	\$4,000,000
Deployment Support		
Signing/Striping Database	Each	\$320,000

Operations and Maintenance

The following personnel categories were included for each project that required additional staff for operations:

Classification	Salary/Year
Engineering Supervisor	\$60,000
Staff Engineer	\$50,000
Field Supervisor	\$50,000
Field Technician	\$40,000

The maintenance cost was generally assumed to be approximately 10 percent of the capital cost per year and was adjusted based upon the project type and service lives of the system components and equipment.

F:\USERS\94\J94-045\DOC\FINAL\COST.H